

# Feed the Future Innovation Lab

## For Collaborative Research on Nutrition - Asia

### Purdue University - Annual Report - Year 3

## Feed the Future Innovation Lab

For Collaborative Research on Global Nutrition

**Annual Report**  
**Purdue University**  
**Year 3 (2012-2013)**  
***Feed the Future Nutrition Innovation Lab - Asia***

**Principal Investigator:**

Gerald Shively  
Purdue University, Department of Agricultural Economics  
403 West State Street  
West Lafayette, IN 47907  
Email: shivleyg@purdue.edu

**Objective 1 (as stated in Year 3 Work Plan): Research**

Understand and measure the connections between agricultural capacity, technology adoption, nutrition outcomes, and conditioning factors at levels of aggregation ranging from household to district levels. The key objective is to develop an empirically-based and data-driven understanding of the overlap between agricultural issues and health/nutrition issues in Nepal, so as to improve the effectiveness of nutrition policy in Nepal.

*Substantial progress achieved and efforts continuing, as detailed below.*

**Specific Objectives (as stated in Year 2 Work Plan): Data Collection**

No primary data collection is envisioned at this time.

*No primary data collection (survey) activities were undertaken in Nepal during the year. However, we did work with partners in the Ministry of Agriculture to obtain what we expect will be a very important set of monthly data on agricultural prices covering more than 45 districts and 20*

*commodities. To the best of our knowledge these data have not been previously released to the public or analyzed in detail.*

### **Specific Objectives (as stated in Year 2 Work Plan): Capacity Building**

Increase the capacity and effectiveness of research institutions in Nepal and train students at the graduate level to become contributing members of the global community fighting against hunger and malnutrition.

*Progress achieved, as detailed below.*

### **Introduction/Overview of Work Plan Rationale/Objectives**

Nepal faces a number of development challenges, including poor agricultural performance, and chronic and widespread child malnutrition. This Work Plan aims to study available evidence regarding food security, malnutrition and related topics in Nepal and to undertake primary research on key issues relating agriculture to nutritional outcomes, while simultaneously engaging in training to improve knowledge and capacity in Nepal. We attempt to work closely with the ME (Management Entity) and project partners in Nepal to build new collaborations and strengthen existing collaborations with Nepalese partners around the topic of agriculture and nutrition. Work Plan activities are designed to be fully aligned with Nepal's Integrated Nutrition Plan (INP) goals and priorities as they relate to agriculture

### **Section I: Research Activities and Progress on Specific Objectives**

#### **Focal area: Identification of Priority Research Areas**

Activity 1: These activities were completed in Years 1 and 2.

#### **Focal area: Synthesis of Existing Programs and Projects**

Activity 2: In Year 3 we completed these activities. We secured access to a number of datasets, including multiple rounds of the Nepal Living Standards Survey (NLSS), Nepal Demographic and Health Survey (DHS) data, and remotely-sensed satellite data (maximum value Advanced Very High Resolution Radiometer (AVHRR) Normalized Difference Vegetation Index (NDVI) composites from the NASA Global Inventory Monitoring and Modeling Studies (GIMMS) group at NASA's Biospheric Sciences Branch). Working directly with Nepal's Central Bureau of Statistics, we successfully gained access to the most recent round of the NLSS data (2011). We also obtained from the Ministry of Agriculture a large dataset consisting of agricultural market prices observed at monthly intervals in more than 45 Nepalese districts and 4 Indian border markets. These data cover more than 20 important agricultural commodities and constitute approximately 40,000 price observations over the period 1998-2011. In the coming year we will be incorporating these data into our analysis of child growth, assessing the empirical evidence regarding the role of agricultural prices and price variability on nutrition outcomes.

**Focal area: *Discrete Socio-Economic Analysis***

Activity 3: Current efforts focus on generating research deliverables from prior investments of time and resources. In Year 3 we made substantial progress on several fronts and have achieved momentum on analysis and writing. In keeping with our goal to develop useful data and make these data available to other members of the NIL research team, we released an analysis-ready dataset to project partners. We have developed a pipeline of research papers, some of which have been submitted and are now in peer review, and some of which are in working paper form. Two Master of Science theses have been completed and a PhD dissertation is underway. A partnership with a graduate student at Tribhuvan University was successfully completed during Year 3.

***Lessons Learned and Challenges in Implementing Proposed Activities***

No impediments to progress at this time.

***Solutions/Resolutions Applied or to be Applied***

N/A

**Section II: Capacity-Building Activities****Focal area: *Degree Training***

Activities: Ganesh Thapa began his PhD training in Agricultural Economics at Purdue University in August 2012, after spending part of the summer of 2012 in Nepal working as a consultant to the project. Mr. Thapa successfully completed his first-year PhD qualifying examination in the summer of 2013 and is currently generating a prospectus document for presentation later this year. Professor Patrick Webb has agreed to serve as an outside committee member for Mr. Thapa. We are working to position Mr. Thapa for successful completion of his PhD and reintegration to the academic and policy research community in Nepal. A second student, Celeste Sununtnasuk, completed her MS degree in Agricultural Economics at Purdue University in May 2013. She worked extensively with Nepal DHS and NLSS data and recently joined IFPRI in Washington, DC. Binod Khanal, a MS student at Tribhuvan University, completed his degree in February 2013. Mr. Khanal undertook fieldwork with the support of a small NIL grant administered by Purdue.

***Lessons Learned and Challenges in Implementing Proposed Activities***

Identifying well-prepared host-country students for graduate degree training in the US has been a significant challenge. From a logistical point of view, early project delays and the substantial investment in student recruitment, screening and processing has meant that we are likely to train only a single Nepalese student at the PhD level.

***Solutions/Resolutions Applied or to be Applied***

We have made a commitment to support Mr. Thapa and it is essential that we maintain continuity of funding to support him through completion of his degree. If the NIL project ends before he completes his degree, we may need to hold budget in reserve and explore options for a no-cost extension beyond 2015.

### **Outputs (not previously reported in past annual reports)**

Shively, G. and C. Sununtnasuk (2013) "Agricultural Diversity and Child Stunting in Nepal." Currently under review at the *Journal of Development Studies* for a special issue on Agriculture and Nutrition. [Available in working paper format.]

Brown, M., K. Grace, G. Shively, K. Johnson, and M. Carroll (2013) "Using Satellite Remote Sensing and Household Survey Data to Assess Human Health and Nutrition Response to Environmental Change." Currently in review at *Population and Environment*. [Available in working paper format.]

Khanal, B., P. Regmi, G. Shively, G. Thapa, and C. Dhakal (2013) "Roads, market access and poverty: the case of the Chepang community in Nepal." Currently in review at the *Journal of Agricultural Science and Technology*. [Available in working paper format.]

Sununtnasuk, C., G. Shively and M. Brown (2013) "Does Environmental Variability Help to Explain Child Nutrition Outcomes? Evidence from DHS and Satellite Remotely-sensed Data in Nepal." Currently in preparation for submission to *Food and Nutrition Bulletin*. [Available in working paper format.]

### **Leveraging and Cost Sharing**

Substantial leveraging for Year 3 Work Plan activities in Nepal came in the form of NASA support for our collaboration with Dr. Molly Brown at NASA. While it is not possible to put an exact dollar amount on the value of this leveraging, Dr. Brown has devoted substantial amounts of time to our efforts, served as an external committee member for one graduate student at Purdue University, participated in a NIL-sponsored organized panel, and continues to collaborate on data analysis and writing. In our use of remotely-sensed vegetation data, we are creatively leveraging hundreds of millions of dollars in past U.S. government investment in satellite data collection and processing.

### **Vignettes**

We organized a special session at the 2013 annual meeting of the Agricultural and Applied Economics Association in Washington, DC, entitled "Agriculture and Nutrition Linkages." The moderated session included four papers focusing on different aspects of the topic. The first paper, "Impacts of Agriculture on Nutrition: Nature of the Evidence and Research Gaps" (by Patrick Webb and Eileen Kennedy, Tufts University), synthesized the results of 10 reviews conducted since 2000, highlighting their major conclusions and the implications of those conclusions for planned and future research. The second paper, "Agricultural Development and Nutrition: A Dynamic Panel Analysis" (by Jan

Dithmer and Awudu Abdulai, University of Kiel), studied a cross-section of countries for the period 1980-2007 to identify key determinants of food and nutrition security, as well as the impact of agricultural development and trade on food security and nutrition. The third paper, "Agriculture and Nutrition in Nepal and Uganda: Evidence from Survey and Remotely-sensed Data" (by Gerald Shively, Purdue University and Molly Brown, NASA), reported new empirical findings linking nationally-representative data on child health and agriculture, incorporating remotely-sensed satellite data to account for growing conditions. The fourth paper, "Using High Resolution Remotely Sensed Data to Re-Examine the Relationship between Agriculture and Fertility in a Pre-Transitional Setting" (by Katherine Grace, University of Utah and Nicholas Nagle, University of Tennessee), extended historical studies of fertility and agriculture to examine the impact of local food production on fertility outcomes in Mali, taking advantage of geo-referenced health data and recently developed analytic strategies from the remote sensing literature. Given the novelty of data and methods employed in these papers, and the wide geographic coverage of the papers, there was high interest and attendance. Will Masters, Tufts University, served as a moderator for the session.